

Research Report Summary



SAFER-SIM University Transportation Center, 69A3551747131

Michelle Reyes, MSE, and Elizabeth O'Neal, PhD, MPH 4/6/21

Extended Evaluation of Training Programs to Accelerate Hazard Anticipation Skills in Novice Teen Drivers

The ability to efficiently and effectively respond to emerging hazards on the roadway is critical to safe driving. Among novice teen drivers, 45% of crashes have been attributed to a failure to identify emerging threats on the roadway [3].

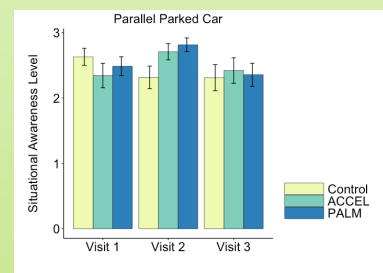
Experienced drivers are able to detect and respond to potential hazards with little cognitive effort (e.g., [7]), whereas novice drivers seem to require experience on the roadway in order to gain this skill.



Forward scene camera view



The NADS-2 Driving Simulator was used to assess novice teen drivers' glances and driving performance in response to many potential hazards in the virtual environment. The hazards were selected from the two training programs.



When accessing the highest level of situational awareness (SA) for a parallel parked car preparing to pull out into the driving lane, both PALM and ACCEL training programs were associated with higher SA relative to controls six weeks after training. However, all conditions achieved similar levels of SA at the third visit about six months after training.

The AAA Foundation for Traffic Safety (AAAFTS) recently sponsored the creation of two programs that aim to hasten the development of hazard anticipation and mitigation skills: the

“Results did not indicate robust effects of the either training program. Both programs seemed most effective in accelerating participants’ detection and mitigation of hazards that threatened to impede the driver’s forward travel.”

Perceptual/Adaptive Learning Module [PALM; 4] and the Accelerated Curriculum to Create Effective Learning [ACCEL; 5]. The current study is an extension of a project award from the AAAFTS that used simulated driving to evaluate the two programs compared to a control group. The goal of this SAFER-SIM project is to determine if the hypothesised effects of the two training programs persist after six months.

Participant were ages 15 and 16 and began the study within two weeks of obtaining a license allowing them to drive independently. The study employed a pre-, post-,and follow-up design whereby participants completed three, hazard-laden study drives over a 6-month period. At the first visit, participants completed a baseline study drive and, if assigned to one of the two training conditions, completed the respective program. After six weeks and 24 weeks of independent driving, participants returned to complete the second and third study drives.

Results did not indicate robust effects for either training program. Both programs seemed most effective in improving participants’ detection and mitigation of hazards that threatened to impede the driver’s forward travel. Neither program showed significant benefits to attention maintenance during a dialing task, though this skill was specific to the ACCEL training program.

Outcomes

This research effort was the first evaluation of the PALM training and the first independent evaluation of the ACCEL training. These results add to the body of knowledge about hazard training programs for novice drivers.

The creation of three hazard-laden drives that can be utilized for future work on teens’ ability to detect and respond to emergent hazards on the roadway are the primary, tangible outcome of the study.

Impacts

The effects of the training were limited and varied in their persistence over the six-month study period. There was not strong evidence that either training program systematically impacted performance on the target skills in the driving simulator. These findings might inform revisions to the training programs or alternative methods of evaluation.

References

1. Mayhew DR, Simpson HM, Pak A. Changes in collision rates among novice drivers during the first months of driving. *Accident Analysis & Prevention* 2003;35:683-91.
2. Foss RD, Martell CA, Goodwin AH, O'Brien NP. Measuring changes in teenage driver crash characteristics during the early months of driving: AAA Foundation for Traffic Safety; 2011.
3. Curry AE, Hafetz J, Kallan MJ, Winston FK, Durbin DR. Prevalence of teen driver errors leading to serious motor vehicle crashes. *Accident Analysis & Prevention* 2011;43:1285-90.
4. Lerner, N., et al., *Development of a Novice Driver Training Module to Accelerate Driver Perceptual Expertise (March 2017)*. 2017.
5. Fisher, D.L., et al., *Accelerating teen driver learning: Anywhere anytime training*. 2017, AAA Foundation for Traffic Safety: Washington, DC.